

5.1 Defensive Driving

The job of a transit operator is primarily that of driving safely and courteously. Your ability to handle a bus in this manner will go a long way in proving you value to *SYSTEM NAME*. Driving defensively to prevent accidents reduces insurance and claim costs and ensures on-time delivery of transportation services to the public.

Accidents are either preventable or not preventable. The preventability of an accident depends upon the actions taken by you to prevent it regardless of the incorrect actions of others or adverse weather conditions. Defensive driving on your part requires:

1. Knowledge and strict observance of all traffic rules and regulations applicable to the State of Pennsylvania. You are responsible for knowing them (and any other federal or local laws which are applicable) and strictly adhering to them. In addition, all traffic fines are the responsibility of the operator.
2. Constant alertness for the illegal acts and driving errors of other drivers and the willingness to make timely adjustments in your driving so that these illegal acts and errors will not involve you in an accident. Being alert to traffic conditions around you and keeping your mind on driving will help you detect potentially hazardous situations and give you time to plan defensive actions to avoid them.
 - Keep your eyes constantly moving -- right, left, and especially ahead.
 - Check traffic behind frequently and beware of blind spots that may hide approaching vehicles.
 - Avoid unnecessary conversations with passengers while the bus is in motion.
 - Do not conduct non-driving duties such as punching transfers or writing while driving.
 - Expect the unexpected at all times.
3. Knowledge of, and intelligent adjustment of your driving techniques to, special hazards presented by abnormal, unusual or changing conditions in the mechanical functioning of your vehicle, type of road surface, weather, degree of light, kind of traffic, and your physical condition and state of mind.
4. Taking no chances. Do not assume that all pedestrians and motorists will exercise the same degree of care or caution that you do. When nearing a street or highway intersection, look out for pedestrians and automobiles approaching from both directions, give sufficient warning of your presence and intentions, and don't take chances! Don't force your right-of-way at the risk of an accident. Adjust your speed to prevailing conditions. It is important to carry passengers on schedule, but more important to carry them safely.

UNDER NO CIRCUMSTANCES SHOULD SAFETY BE SACRIFICED FOR THE SCHEDULE.

5. An attitude of confidence that you can drive without ever having a preventable accident.

[Defensive driving resources are available from PennTRAIN. The National Safety Council's Coaching the Bus Driver and Coaching the Van Driver may be appropriate in this section.]

5.2 Starting and Stopping

When the operator checks both the right and left mirrors and uses their turn signal, then starts their bus smoothly and accelerates at an even rate, without interruption, to the desired speed, they have made a perfect start. When the operator checks both right and left mirrors using turn signals, slows down at an even rate and makes a smooth stop at the desired point, they have made a perfect stop.

Prepare to Start:

1. If there is a vehicle nearby, always use turn signals and wait until vehicle has moved and is at least fifteen feet away before you leave the stop.
2. Check that other vehicles and pedestrians are clear and will stay clear.

Start:

3. On dry pavement, start bus smoothly and accelerate at even rate.
4. On slippery pavement, start smoothly and slowly, depressing the accelerator gradually. If drive wheels begin the slightest spin or sideslip, release pedal immediately. Depress the pedal lightly again, releasing immediately if wheels again spin or sideslip. Repeat until bus moves without spin or sideslip.
5. Pick up speed gradually and maintain proper following distance behind traffic ahead. (2 – 3 seconds under 40 mph, 3 – 4 seconds above 40 mph.)

Stopping. Know the braking capabilities of your bus at all times. Braking distances can vary from bus to bus; therefore, always make a test stop as soon as practical when you leave the garage or make a relief. Also, never assume that your bus will brake the same for an entire run.

Depending upon such conditions as number of passengers being carried and operation on grades, braking will vary. Always be prepared to slow down or stop. When your foot is not on the accelerator pedal, it should be at the brake pedal.

Where to apply the brakes depends on existing conditions.

1. On a dry, level street with a light load:

At this Begin to brake this distance
Speed from the intended stop

10 mph	1 1/2 Bus Lengths
20 mph	3 Bus Lengths
30 mph	5 Bus Lengths

2. On a downgrade or with a standing load, use your own judgment as to where to begin braking but allow more distance than shown above.
3. On a slippery street, allow two to three times the distances shown above.

How to apply the brakes depends on the condition of the street.

1. On a dry street, apply brakes smoothly to the extent of brake required. As speed is reduced, let up on the brake pedal gradually so that the pedal is slightly depressed at final stop.
2. On a slippery street, depress the brake pedal lightly. Slow, gentle pressure should prevent the wheels from locking up. If the rear wheels begin the slightest slide or side-slip release immediately to allow the wheels to roll. Depress the pedal lightly again, releasing immediately if wheels again slide or side-slip. Repeat until wheels no longer slide or sideslip.

An alternative for stopping a transit bus under slippery conditions employs the heel and toe method -- heel on the brake pedal and toe on the accelerator. This action requires great skill to affect a balance of laboring the motor to slow the movement of the bus without skidding the wheels or killing the motor. The speed of the bus should be below 13 MPH when beginning such an action.

3. Do not "fan" the brake pedal. This practice causes poor performance, rough operation, which is uncomfortable and unsafe to the passengers, and causes excessive wear on the brakes. Fanning does not increase brake pressure, but decreases both reservoir and brake pressure.

When stopped, keep brakes applied. When stopping behind vehicles, stop five feet back. Stop ten or more feet from other vehicle if stopped on a hill and roadway is icy; tires are hot and slick from a stopped position and may cause poor traction.

5.3 Maintaining Safe Following Distance

When following moving traffic, the operator must be able to stop smoothly and safely if the vehicle ahead should slow down or stop suddenly. Your ability to stop safely in time is a combination of perception distance (the distance your vehicle travels from the time your eyes see a hazard until your brain recognizes it; the perception time for an alert driver is about 3/4 second or 60 feet if you are traveling at 55 mph) reaction distance (the distance traveled from the time your brain tells your foot to move from the accelerator until your foot is actually pushing the brake pedal; the average driver has a reaction time of 3/4 second or another 60 feet traveling at 55 mph) and braking distance (the distance required to bring your vehicle to a full stop after the brakes are applied; at 55 mph on dry pavement with good brakes it can take a vehicle about 170 feet to stop or about 4-1/2 seconds. As such the total stopping distance at 55 mph will take about 6 seconds and your vehicle will travel the distance of a football field or 290 feet.

1. Whenever you double your speed, it takes about four times as much distance to stop and your vehicle will have four times the destructive power if it crashes. At speeds below 40 mph you should allow 4 seconds between you and the vehicle ahead. At speeds above 40 mph you should allow at least 5 seconds between you and the vehicle ahead.
2. Watch traffic conditions and signals ahead to anticipate when vehicles ahead will have to slow down or stop so that you will be ready to adjust your following distances accordingly.
3. If a passing vehicle begins to move into your driving lane, place your foot at the brake pedal or apply brakes so that you will have the proper following distance when the passing vehicle is ahead.
4. Outside downtown areas, drive no closer to another bus than 600 feet or about one city block. This will allow adequate distance between buses so passengers are not passed by and can read the destination signs.

5.4 Changing Lanes

Unless otherwise directed, buses must be operated in the right hand curb lane on city streets and the right or middle lane of expressways at all times. However, there are times when the operator must change lanes to get around parked vehicles or objects, to pass slower moving vehicles, or to move into the proper lane before making a turn.

1. Be certain that the lane you intend to move into is clear. Use mirrors to check alongside and to the rear. Remember to check the space to your immediate left since it will not show up in your mirror. Foot must be at the brake pedal while check is being made.
2. When the other lane is clear, give the proper turn indication and move over at a gradual angle.

3. When changing lanes to pass a vehicle or object, begin to angle out about two bus lengths away from the vehicle or object so that you will be able to straighten out the bus before you pass. Maintain a 3-5 foot clearance while passing.
4. Before returning to your driving lane, give the proper turn indication.
5. When returning to your driving lane after passing a parked vehicle or object, angle in after the rear wheel is past the front bumper of the parked vehicle or the forward edge of the object.
6. When returning to your driving lane after passing a moving vehicle, make certain that you are clear of the entire vehicle before starting to angle in. After returning to your lane, cancel your turn signal.

5.5 Intersection Operation

Approaching Intersection:

1. Have bus under full control, prepared to slow down or stop if vehicles or pedestrians should cross into the path of your bus.
2. Do not proceed into the intersection unless it can be cleared with the entire bus.
3. Be alert at all alleys and driveways or other locations where vehicles may cross into the path of the bus.

Moving Through Intersection:

1. Always keep both hands on the wheel. Do not conduct non-driving duties, such as issuing transfers.
2. Proceed with caution while checking traffic and pedestrian movement.
3. Resume speed only after clearing intersection.

NOTE: "Bus under full control" means that the operator is alert and is fully aware of traffic and pedestrians; they have both hands on the steering wheel; they let up on the accelerator pedal and places foot at the brake pedal or applies brakes depending on the circumstances; they are fully aware that passengers may be thrown off balance unless they are prepared to make a smooth, safe stop in traffic or pedestrians cross their path.

5.6 Passing and Being Passed

When passing parked vehicles or fixed objects, vehicles moving in the same direction, or vehicles moving in the opposite direction, the operator's main concern is clearance. The operator must check that they have enough clearance before passing and they must maintain that clearance while passing.

Before and after passing, it may become necessary for the operator to change lanes. When this is necessary, follow the procedures for changing lanes. When being passed, the operator must also be concerned with clearance. The operator must be on the alert for any indication that the passing vehicle may not allow proper clearance while passing. If other vehicles crowd, slow down to allow them to move on. Many streets are so narrow as to make passing and being passed very hazardous.

5.7 Passing Parked Vehicles or Fixed Objects

Prepare to Pass:

1. Check clearance before beginning to pass. If clearance is doubtful, stop the bus and get out to check.

Passing:

2. Keep the bus in a straight line.
3. Maintain clearance of 3-5 feet where possible.
4. Where clearance is close, operate at extremely slow speed, with foot at the brake pedal.
5. If there are indications that a parked vehicle may pull into the path of the bus (a driver in the seat, exhaust smoke, lights on, front wheels turned out) tap horn to warn driver that you intend to pass and place foot at brake pedal or apply brakes so that you can stop safely if the vehicle pulls out.

5.8 Passing Vehicles Moving in the Same Direction

Prepare to Pass:

1. As you begin to overtake the vehicle, tap your horn to warn the driver you intend to pass.

Passing:

2. Maintain 3-5 feet clearance while passing.
3. Keep bus in straight line while passing.
4. If vehicle moves toward bus, drop back.
5. If vehicle speeds up, drop back.

5.9 Passing Vehicles Moving in the Opposite Direction

1. Be prepared to slow down or stop if approaching vehicle should cross the center line.

2. Watch for hand signals or other indications that vehicle may turn into the path of your bus.
3. Stay as far to the right of the center line as you safely can.

5.10 Being Passed

Other Vehicle Overtaking from the Rear:

1. Watch for indication that the vehicle wishes to pass. Some clues to this are: driver of approaching vehicle sounds horn, moves into passing lane, or straddles lane periodically to check passing room.
2. Stay to the right while maintaining 3-5 feet clearance.
3. If you are tailgated, slow down to encourage the driver to pass you. Maintain your own safe following distance.

Other Vehicle Passing:

1. Allow the vehicle to pass safely. Do not increase speed while vehicle is passing.
2. If vehicle passing reduces clearance, slow down or stop, if necessary.
3. If passing vehicle enters your lane after passing your bus, place foot at the brake pedal or apply brakes so that you will have the proper following distance when the passing vehicle is ahead.

5.11 Passing School Buses and Emergency Vehicles

1. Do not pass school buses, which are displaying flashing signals indicating, loading or unloading of children. Stop and remain stopped until all children are clear of the roadway and the bus moves again and red flashers are off. However, when the roadways are separated by a physical barrier or a lane or an unpaved median area, the driver on the separated does not have to stop for the school bus.
2. As soon as any emergency vehicle siren is heard, the bus must be stopped immediately and remain stopped until the emergency vehicle (or vehicles) have passed.
3. When stopping for an emergency vehicle, pull to the right hand curb and leave the street clear, if at all possible.
4. If a vehicle approaches rapidly with the horn blowing continuously, and/or blinking lights, regard it as an emergency vehicle and react accordingly.

5.12 Making a Right Turn

When the entire bus clears the curb at the corner and stays as nearly as possible in its own lane of traffic, the operator has made a perfect right turn. To make this perfect turn, the operator must consider the following factors: where to stop prior to the turn if a stop is necessary, how far to angle out when leaving the curb, where to begin the turn, the speed of the bus while making the turn, and how to straighten out after making the turn.

The procedures for making a right turn under average conditions are illustrated in Figure 1. If the corner curb is rounded off very little, the angle of the bus must be greater than that shown in the illustration. If the corner curb is rounded off a great deal, the angle of the bus may be less than that shown in the picture. When there are unusual conditions such as illegally parked cars or temporary obstructions, these procedures must be adapted and the operator must use their best judgment. At some intersections, it will be necessary to straddle both lanes to avoid running over the curb.

Approach

1. Activate turn indicator 150 feet from the intersection.
2. Follow procedures for curbing, but prepare to make a stop 25 feet from corner. If parked cars prevent curbing, prepare to make a service stop short of the crosswalk. If there are passengers to board or alight, stop; if not, reduce your speed to 3-5 MPH.

Prepare to Turn

3. Stop issuing and receiving transfers before leaving the bus stop. Concentrate fully on driving. When the bus is at the curb, wait for a gap in traffic and then angle out until the front doors are about 10 feet out and you can sight through the front door down the curb line of the street into which you are turning. While angling out, give right turn signal.

When the bus is alongside parked cars and curbing is not possible, proceed straight forward until you can site down the curb line of the street into which you are turning. While proceeding, activate your right turn signal.

Turn

4. While turning, use a steady hand-over-hand movement.

Operate at 3-5 MPH. Have your foot on the brake pedal unless your speed is less than 3 MPH. Watch the front overhang; be especially cautious if the front of the bus crosses the centerline. Use your right side view to check that the right side of the bus will clear the corner curb and vehicles or pedestrians. If you are unsure of clearance, stop the bus to check. Use your left side view mirror to check clearance with vehicles and pedestrians on the left side of the bus.

Straighten Out

5. Straighten out into your driving lane, keeping 3-5 feet clearance of the curb or parked cars. After the bus is straightened out, resume your normal speed.

5.13 Making a Left Turn

When the bus stays as nearly as possible in its own lane of traffic, the operator has made a perfect left turn. To make this perfect turn, the operator must consider the following factors: where to begin the turn, when to begin the turn in relation to oncoming traffic, the speed of the bus when making the turn, and how to straighten out after making the turn. Figure 2 illustrates the procedures for making a left turn under normal conditions.

If parked vehicles or other obstructions are in the path of the bus, the turn may have to be started at a different point than that illustrated here. Turning from a one-way street may also affect the start of the turn. In these and other unusual situations, the procedures may need modification and the operator must use their own best judgment.

Approach

1. Move the bus into the center or left turn lane at least 150 feet before the intersection is reached. Activate turn indicator 150 feet from the intersection. Reduce speed so that the bus will be moving at 3-5 MPH when it reaches the intersection.

Prepare to Turn

2. When vehicles are approaching from the opposite direction:
 - a. Stop with the front of the bus at the center of the intersecting street.
 - b. Keep wheels straight while standing in the intersection.
 - c. Wait for a gap in traffic.

When no vehicles are approaching from the opposite direction, begin your turn when the front of the bus is at the center of the intersecting street.

Turn

3. Use steady hand-over-hand movement. Operate at 3-5 MPH (have your foot on the brake pedal unless your speed is less than 3 MPH). Watch the front overhang; be especially cautious if vehicles are parked close to the far side corner curb. Use your mirrors to check clearance with vehicles and pedestrians. Where no service stop is required after the turn, begin to straighten out when the right front corner of the bus is just short of the curb.

Straighten Out

4. Where no service stop is required, straighten out into your driving lane, keeping 3-5 feet clearance from the curb or parked cars. After the bus is straightened out, resume your normal speed.

Where a service stop is required, straighten out so that the bus is parallel to and about 1 foot from the curb; then stop, be certain the rear of your bus has cleared the intersection.

5.14 Standard Curbing Procedures

When the bus is stopped parallel to the curb and about a 6-8" from the curb, the operator has made a perfect passenger stop, from a technical point of view. Actually, the stop is not perfect unless it provides safe access for passengers through both front and rear doors. Six-eight inches is convenient for the passengers and gives them an easy step directly from the curb to the bus and from the bus to the curb. Unfortunately, vehicles often park in or near the loading zone and ideal stop cannot always be made. Also, always remember to use your turn signals when pulling into or pulling out of a bus stop, and **use your 4-way hazard lights while stopped.**

The procedures for curbing are based on the amount of space available at the curb. It is important to provide a safe place for passengers to board and alight, and keep the driving lane as clear as circumstances permit. There are times when it is not possible to follow these procedures completely. If the curbing is broken or blocked, if there are cars parked along the curb, or if the stop is otherwise obstructed, the operator must use their best judgment in determining the safest place to stop. In many situations, it would be best to call the passenger's attention to the situation and suggest the safest way to enter or leave the bus. As an example, access may be restricted to the front door of the bus. Usually, the front of the bus is closest to the curb and the curb next to the crosswalk is generally clear of obstruction.

REMEMBER THESE POINTS, TOO

1. Come to a complete stop before opening the doors.
2. Keep your foot on the brake while the doors are open.
3. Check interior mirrors and right outside mirror, then close the doors before moving the bus.

5.15 Leaving a Service Stop

Prepare to Move

1. Look personally and use mirrors to check that boarding and alighting passengers are clear of the doors.
2. Close doors.
3. After the last boarding passenger has deposited the correct fare, make sure passengers moving to seats are prepared for the start. Warn them if necessary. If passengers must stand, wait until they reach the first row of seats that face forward to allow them to hold on to back rest.
4. Check that all vehicles and pedestrians to the left, right, and front are clear and that the traffic signal (if any) indicates proceed.
5. Turn on your turn signal to alert traffic that you will be moving out of the stop.
6. Take your foot off the brake.

Move

7. Follow procedures for starting.
8. Move forward, gradually gaining 3-5 feet clearance from the curb. If parked vehicles or fixed objects prevent this, follow procedures for changing lanes.

Special Note: Passengers alighting along busy streets that must cross the street should be instructed to cross behind the bus or wait until the bus has pulled away from the stop. This will provide the most visibility for the passenger to see oncoming traffic.

5.16 Backing a Vehicle

Operators must take every precaution to avoid finding themselves in situations in which they must back their vehicle. If it is absolutely necessary to back a vehicle, the operator must either (a) go personally to the back of the bus to ensure that there is no object behind the bus, or (b) have another person guide them back. As an added precaution, the horn should be sounded before backing. In all instances, do not back the vehicle without assistance.

5.17 Special Operating Situations

5.17.1 Adverse Weather Conditions

- Refer to the # 1 rule of Defensive Driving - SLOW DOWN!!!
- Reduce speed so that you have better control of the bus. Safety must always come ahead of schedules.
- Follow starting and stopping procedures noted earlier for operation on slippery surfaces.
- Increase clearance between bus and parked cars and fixed objects to provide a safety factor in case side-slipping occurs. However, do not allow so much clearance that another vehicle could get between the bus and the curb, fixed object, or parked vehicle.
- Increase following distance to allow the additional distance that may be required for braking. The more slippery the street, the greater your following distance must be.
- Avoid quick or abrupt turning movements. Steer slower and more gradually to reduce the possibility of skids.
- Protect your passengers. Make warning announcements to boarding and alighting passengers. Avoid any actions to hurry passengers—such actions may cause passengers to slip and fall.
- If there are snow banks at service stops, keep sufficient clearance from snow banks so that passengers can step into or from the street, not the snow bank.
- When snow is banked up at the curb, operator is to ask all passengers to alight via the front door. This will prevent passengers from being struck by the rear wheels of the bus if it slips to the curb.

5.17.2 Railroad Crossings

- You need not stop at a crossing where a police officer or a traffic-control signal (stop light) directs traffic to proceed.
- After making a stop at any railroad crossing, the shifting of gears is prohibited until all the tracks have been crossed. If a train has just passed over the crossing, do not drive

onto the tracks until the train has sufficiently cleared the crossing so that you are sure there is no train hidden by the first train approaching on an adjacent track.

- Do not proceed after safety stop when a gate or other mechanical signal device is sounding or flashing a warning, except in cases where view of the track is unobstructed in all directions and no trains are approaching, or when there is a flagman on duty who gives you a signal to proceed.
- Where gates protect crossings, stops must be made at a location that will permit gatemen to properly operate the crossing gates when trains are approaching.
- Do not drive your bus around, through, or under any crossing gate while the gate is closed or being opened or closed. You must never accept a lack of movement of the gate as an indication that the device is either in or out of order or not properly handled. You must always take a railroad grade crossing as a warning of danger and must not cross the tracks until you are certain that no train is approaching.
- Should your bus become stalled on a track, immediately request and assist passengers to alight to a place of safety. Then make every reasonable effort under the existing conditions to warn trains approaching from either direction.

5.17.3 Freeway Operation

- Use "on" ramp (acceleration lane) to gain speed, and then merge smoothly with freeway traffic. Observe other traffic using the entrance ramp; watch particularly that the vehicle(s) ahead of you have merged successfully before proceeding.
- Watch for motorists entering the freeway and adjust your speed up or down to assist them in merging.
- Obey posted speed limits and maintain a constant speed whenever possible.
- Use a safe following distance at all times and govern speed accordingly. Allow a minimum of one bus length for each ten (10) MPH of speed. Stopping distance between your bus and the vehicle ahead should be sufficient to avoid chain reaction collisions.
- Follow lane change procedures discussed earlier and plan ahead to avoid frequent lane changes.
- Keep your eyes moving constantly -- far ahead -- just ahead -- left to right. This avoids fatigue and keeps you aware of other traffic.
- Avoid "rubber necking" at any unusual occurrence. Be aware of it, but concentrate on your own vehicle.
- Do not weave from one traffic lane to another or straddle lane dividing lines.
- Stay in the far right-hand lane whenever possible.

- Allow ample time and give proper signals when preparing to exit, slowing down, changing lanes, or making forced stops.
- Make no sudden stops except in an emergency. In the event you must stop on the expressway, observe following traffic and make sure it responds to your signal indicating slowing down or stopping. Signal gradually and, if necessary, pull off the pavement.
- If you become aware that your vehicle has developed some sort of trouble, exit the freeway as soon as possible.
- Do not travel alongside another bus in an adjacent lane except when buses are taking different directions on ramps and then for only a short distance.
- Keep bus properly lighted before daylight and after dark.

5.17.4 Operating Through Water

Drive slowly (not to exceed 5 MPH) through standing water to prevent damage to the equipment. The vehicle must not be driven through water deep enough to reach any part of the engine. Brakes should be tested immediately after operating through deep water to check for water in the brake drums. If the brake condition is poor and does not improve after testing, call the Dispatcher.

5.17.5 Funerals and Parades

Buses must never be operated so as to cut in or in any way interfere with a funeral procession or convoy. Most funeral processions will be identified with "Funeral" pennants on radio antennas, or stickers on automobile windshields, and by headlights turned on.

5.17.6 Passing Schools and Playgrounds

Operators must use extreme caution while operating in the vicinity of schools and playgrounds. The school zone speed limit must be observed and the operator must obey signals of the school patrol, police officers and other authorized persons stationed to protect the children.

5.17.7 Leaving, Entering, or Driving on Garage Lots

- Buses being operated inside the garage must be limited to a speed of no more than five (5) miles per hour; speed limit in the yard is fifteen (15) miles per hour.
- Buses must be brought to a complete stop before entering the street and when entering or exiting the garage or storage bays.
- Be especially careful to avoid starting a bus with someone under it or working on it.
- Use extreme caution when moving a bus on the lot. If other vehicles are blocking you, see that they are moved sufficiently before attempting to move your bus.
- During the hours of darkness, dome lights must be on (except on pull-outs and pull-ins over interstate highways when no passengers are aboard).

- If required during normal operation, seat belts should be fastened whenever the bus is moving.
- Operators must not block fire or emergency lanes. These areas must be kept open at all times.
- Be careful in crossing pits and walking through garages. Do not jump across pits.